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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,549	09/22/2003	Shuji Akiya	KAW-305- USAP	6162
28892	7590	05/19/2005	EXAMINER	
SNIDER & ASSOCIATES P. O. BOX 27613 WASHINGTON, DC 20038-7613			SEVER, ANDREW T	
			ART UNIT	PAPER NUMBER
			2851	

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/665,549

Applicant(s)

AKIYA, SHUJI

Examiner

Andrew T. Sever

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-9 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Allowable Subject Matter***

1. The indicated allowability of claim 9 (and accordingly claim 1) is withdrawn in view of the newly discovered reference(s) to Aritake. Rejections based on the newly cited reference(s) follow.

### ***Claim Objections***

2. Claim 9 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 9 is the source of the amendment to claim 1 and should have been cancelled.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aritake et al. (US 6,478,429) in view of Chu et al. (US 5,786,937.)

Aritake teaches in figure 2, a cross dichroic prism for color decomposition, the cross dichroic prism (28) being mounted with a reflection type liquid crystal projector for making a luminous flux from a light source (21) obliquely incident on a reflection type liquid crystal display device (26G), the cross dichroic prism transmitting a green color light component there through and reflecting blue and red color lights components into directions different from each other upstream of the reflection type liquid crystal display device (See figure 3 which shows the paths of the various color lights, although it is a different embodiment the mirrors of figure 3 would work with regards to the basic light paths in the same way);

The cross dichroic prism comprising a blue-reflecting dichroic film (blue reflective film 29B) for reflecting the blue light component and a red-reflecting dichroic film (red reflective film 29R) for reflecting the red light component;

Wherein the luminous flux from the light source is incident on an entrance surface of the cross dichroic prism at an angle making the luminous flux oblique to an axis of the

cross dichroic prism (clearly figure 2 shows the luminous flux making an oblique angle to the axis of the cross dichroic prism.)

Aritake, however, does not teach specifically what the structure of the reflective films and what material the prisms are made of. As detailed in the previous office action mailed on 11/19/2004 Chu teaches a similar prism system for making luminous flux from a light source obliquely incident on a reflection type liquid crystal display device.

Chu teaches in column 3 and 4 table 1 what the reflective films making up the dichroic beam splitter are comprised of: lower and higher refractive index materials alternately laminated on a prism base. The prism satisfies the following condition expression (1):

$$1.105 \leq N_h / N_l \leq 1.450 \text{ if } N_g \leq N_l \quad (1)$$

wherein  $N_g$  is the refractive index of the prism base,  $N_h$  is the refractive index of the higher refractive index material, and  $N_l$  is the refractive index of the lower refractive index material.

Chu further teaches the material that the various parts of the prism are made of: that the base is made of BK7 and the layers are made of  $Al_2O_3$  and  $ZrO_2$  which have index of refractions as provided by the applicant in table 1 of applicant's specification page 22: 1.646 and 1.967 respectively with BK7 having an index of 1.515 (see table 3 of applicant's tables.) This meets expression 1.

Chu teaches in column 1 lines 38-60 that these particular materials allows for easier manufacturing then other techniques while having similar or better optical performance then prior art prisms. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the coatings and prism material of Chu in the cross dichroic prism of Aritake as they allow for easier preparation of the prisms making up the dichroic prism and lower cost.

*With regards to applicant's claim 2:*

Chu's materials are such that the cross-dichroic prism of Aritake in view of Chu is made up in part of a higher refractive material, which comprises of  $\text{ZrO}_2$  and the lower refractive index material comprises of  $\text{Al}_2\text{O}_3$ .

*With regards to applicant's claim 3:*

Chu's materials are such that the cross-dichroic prism of Aritake in view of Chu has its base made of BK7.

*With regards to applicant's claim 7:*

Chu teaches both the lowermost and uppermost layers of Aritake in view of Chu's reflecting dichroic films are made of the lower refractive index material (table 1 of Chu.)

*With regards to applicant's claim 8:*

There are odd numbers of layers.

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5. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aritake in view of Chu as applied to claims 1-3, 7, and 8 above, and further in view of Ho et al. (US 2002/0008770.)

As described in more detail above Aritake in view of Chu teaches a cross dichroic prism with high and low refractive index materials, however they do not teaches using  $\text{Al}_2\text{O}_3$  and  $\text{SiO}_2$  as the high and low refractive index material respectively. Ho teaches a color separation beam splitter, which in paragraph 29 teaches the use of  $\text{Al}_2\text{O}_3$  and  $\text{SiO}_2$ . Such prisms are taught in paragraph 5 and 6 to allow for high-purity and low cost projectors. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to use  $\text{Al}_2\text{O}_3$  and  $\text{SiO}_2$  in the prism of Aritake in view of Chu.

*With regards to applicant's claim 5:*

See Chu, which teaches that the bases comprise of BK 7.

***Allowable Subject Matter***

6. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

7. Applicant's arguments with respect to claims 1-5 and 7-9 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 2003/0071976 to Okuyama et al. teaches in figure 4 a projector utilizing a cross dichroic prism with an oblique incident of the light from the light source.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AS

  
**JUDY NGUYEN**  
**SUPERVISORY PATENT EXAMINER**